REMARKS

Introductory Comments:

Claims 1-20 are pending in the application. Claims 15-20 are allowed. The Applicants respectfully request reconsideration of claims 1-14.

In Response To The Claim Objection:

Claims 4-6 and 12-14 are objected to. The Applicants believe that the Objections are overcome as a result of the following response.

In Response To The Claim Rejections:

Claims 1-3, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horibata et al. (5,801,313) in view of van Seeters (5,283,528).

Regarding claim 1, 8, and 9, according to the Office Action, Horibata discloses a housing (e.g. combination of substrates 2 and 3) and a fixed plate (71) in the housing (e.g. combination of substrates 2 and 3). Horibata also discloses a movable plate (e.g. movable electrode 22/62) in substantially parallel relation to the fixed electrode (31/71). Horibata, as alleged by the Office Action, discloses that an external force is applied to the capacitance sensor; and the electrostatic capacitance (C) is change between the electrodes (62 and 71) (col. 1, lines 60-67). Horibata discloses that the electric signal representing the change in the electrostatic capacitance (C) is used as the output of the sensor and the acceleration is detected. (col. 1, lines 65-67; col. 2, lines 1-5). The Office Action recognizes that Horibata does not disclose that a transimpedance amplifier receives the charge displacement capacitance signal but instead teaches that electric signal representing the change in electrostatic capacitance

is obtained from the capacitance measuring circuit and the acceleration is detected (col. 1, lines 65-67, col. 2, lines 1-5).

According to the Office Action, van Seeters discloses that the output of the capacitor(s) are converted in the transimpedance amplifier(s) (3) (col. 4, line 66-67, col. 5, lines 1-14). Therefore, the Office Action proposes that to modify Horibata employing a transimpedance amplifier would have been obvious to one of ordinary skill in the art at the time of the invention.

The Applicants submit that it would not have been obvious to combine the Horibata and van Seeters references to arrive at the present invention. No reason is shown why one of ordinary skill in the art would modify the Horibata and van Seeters references as the Office Action proposes. The references are not pertinent to the problem of dynamic range of temperature and a granularity sufficient for Inter-Continental Ballistic Missile (ICBM) usage, which is generally considered to be 1 micro g to 20 g's, as are the claims. Applicants' design is unique in that it allows this dynamic range of temperature and granularity while providing an accurate and robust acceleration signal.

The Horibata reference is directed to a capacitive sensor generating an output having excellent linearity (Abstract.), as is typical for force measuring systems. More importantly, however, Horibata does not disclose or teach a transimpedance amplifier receiving capacitor signals and generating scaled voltage signals therefrom or that scaled voltage signals are then used to generated an acceleration signal, as recited in claims 1, 8, and 9. Instead, the Horibata system is conventional in that it includes generating electrostatic capacitance signals and generating acceleration signals from

them. Horibata does not disclose or suggest amplification of the signals, with transimpedance amplifiers or any other amplifiers. The transimpedance amplifier generates a scaled voltage signal, so in addition to providing a wide range of sensor data, the signal is processed to a form allowing convenient and simple generation of accurate acceleration signals (through analog-to-digital conversion, integration, and linearization).

Horibata does not include a transimpedance amplifier, and therefore, Horibata merely generates acceleration signals as a function of movement of its plate or restricted movement of its plate. Problems inherent in the Horibata design, including device sensitivity limitations, are solved therein by adjusting the diaphragm portion of the sensor. (e.g. column 8, lines 5-13.) This type of sensitivity adjustment is less efficient, due to component costs and costs associated with time required for adjustments, than the transimpedance signal processing design of claims 1, 8, and 9.

The van Seeters reference is directed to a conventional accelerometer design including analyzing signals as a function of a ratio of capacitances. (column 3, lines 3-12.) van Seeters, however, does not disclose or teach the use of transimpedance amplifiers for generation of scaled voltage signals from a lone plate-diaphragm accelerometer system as recited in claims 1, 8, and 9. van Seeters also does not teach or suggest that application of the van Seeters system would be in any way beneficial to generating an acceleration signal from a single scaled voltage signal, as is the claimed system. Instead, van Seeters teaches generating multiple capacitor signals, which is substantially different from generating a single capacitance signal. It would not, therefore, have been obvious to modify van Seeters as the Office Action proposes.

The Horibata and van Seeters references are directed to conventional accelerometers and force measuring systems. More importantly, neither of these references discloses or teaches a moveable plate for a single capacitor and a transimpedance amplifier, as recited in claims 1, 8, and 9, generating a scaled voltage signal for generation of an acceleration signal. Further, no reason has been shown why it would be obvious to selectively combine these references to produce the claimed invention. Applicants therefore submit that no motivation has been shown to combine the references as proposed.

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1672, 1577, 221 USPQ 929, 933 (Fed.Cir. 1984). Even if all the elements of Applicant's invention are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the references to arrive at the claimed invention. Therefore, because no teaching or suggestion is found in any of the references for transimpedance amplifiers receiving capacitance signals from a single moveable plate configuration, claims 1, 8, and 9 are believed to be allowable.

The combination of the moveable plate and the transimpedance amplifier described by the Applicants is advantageous in that a charge displacement signal is generated from a single capacitor sensor and converted into a scaled voltage signal. The scaled voltage is further processed in various system components to generate an

acceleration signal. Whereas, the lack of transimpedance amplification of Horibata and the capacitor ratio analysis system of van Seeters both require costly sensitivity adjustments to achieve the accuracy and controllability of the claimed system.

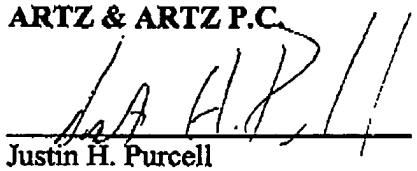
Claims 1, 8, and 9 are believed to be allowable for at least the aforementioned reasons. Claims 2-7 and 10-14 depend from claims 1, 8, and 9 and are also believed to be allowable for at least the aforementioned reasons.

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 50-0476.

The Examiner is invited to contact the undersigned at (248) 223-9500 if any unresolved matters remain.

Respectfully Submitted,

ARTZ & ARTZ P.C.



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